

ABSTRACT

Title of master thesis

Determination of climbing specific maximal oxygen uptake during climbing with increasing inclination and constant speed.

Work objectives

To review the determination of climbing specific maximal oxygen uptake during climbing with increasing inclination and constant speed.

Methods

Twenty six climbers with climbing ability on UIAA scale from 4th to 10th degree were participated in this study. Maximal specific oxygen uptake was measured by climbing test, to exhaustion on climbing wall, where the inclination were changed from 95° (105°) to 135° every three minutes. Speed of climbing was constant on 25 movements·min⁻¹. After a rest, the participants went a maximal running test on treadmill. There were evaluated relationships between climbing ability, inclination and cardiopulmonary variables.

Results

In maximal climbing test, climbers achieved plateau on value $40 \pm 3,5$ ml·kg⁻¹·min⁻¹, without influence on climbing ability or inclination. The climbing ability most correlated with achieved inclination $r = 0,89$ and heart rate $r = 0,41$. Our study confirmed disproportional rising of heart rate against oxygen uptake. Furthermore, there was a strong relationship to be found between ventilation per l oxygen to RER indicating specific breathing mechanism of advanced climbers. More demanding work of upper limbs muscles during overhang climbing, given speed and related

breath frequency could have influence on lower VE and oxygen consumption. Maximal specific oxygen uptake may not been achieved, but the climbing test is suitable for controlled training status.

Key words

Sport climbing, oxygen uptake, applied physiology.